

ON *SULCOBASIS CONCISA* (FÉR.) AND ITS NEAREST ALLIES.

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Read 12th June, 1914.

## PLATES IV, V.

In working out a collection of shells from the Aru Islands, it became evident that the *Sulcobasis* of the *concosa* group from these islands, hitherto usually referred to *rubra*, Alb., is quite a different form. The whole group was therefore critically examined, with the following results.

The species to be discussed are *concosa*, Fér., *rubra*, Alb., and *cumingi*, Gude. It has been thought important to examine, as far as possible, the actual specimens described by the various authors, and thus to determine their correct status. Indeed, it is surprising how scanty the material is on which the authors based their descriptions, for the collectors who visited the habitats of these shells only brought home single specimens, and consequently they are of the greatest rarity in collections. I have been fortunate enough to study and to compare nearly all the specimens quoted in literature. This investigation shows that, though subspecifically different, they agree in so many characters that they must be considered to belong to only one species, which, according to priority, must be called *Sulcobasis concisa* (Fér.). This species, which is also well defined from a geographical point of view, may be divided into three sub-species.

The general diagnosis of *S. concisa* (Fér.), as restricted by me, runs as follows:—

Testa umbilicata, plus minusve depressa, solida, unicolor rufa aut rufo-castanea, striis incrementi regulariter striata, fere lævis, aut sulcis numero variis, plus minusve distinctis, obliquis, irregularibus incisa; spira conoidalis, aut subdepressa aut planiuscula; sutura impressa. Anfractus 6, convexiusculi aut convexi, regulariter accrescentes; ultimus rotundatus, antice plus minusve descendens, ad aperturam dilatatus; umbilicus pervius. Apertura obliqua, obovalis, intus alba, porcellana, colore externo translucente; peristoma vix incrassatum, album, reflexum, marginibus callo albo, arcuato junctis, columellari dilatato.

The three sub-species of the shell, known up to date, are: 1, *S. concisa rubra* (Alb.); 2, *S. concisa concisa* (Fér.); 3, *S. concisa cumingi* (Gude).

1. *SULCOBASIS CONCISA RUBRA* (Alb.). Pl. IV, Figs. 1–12.

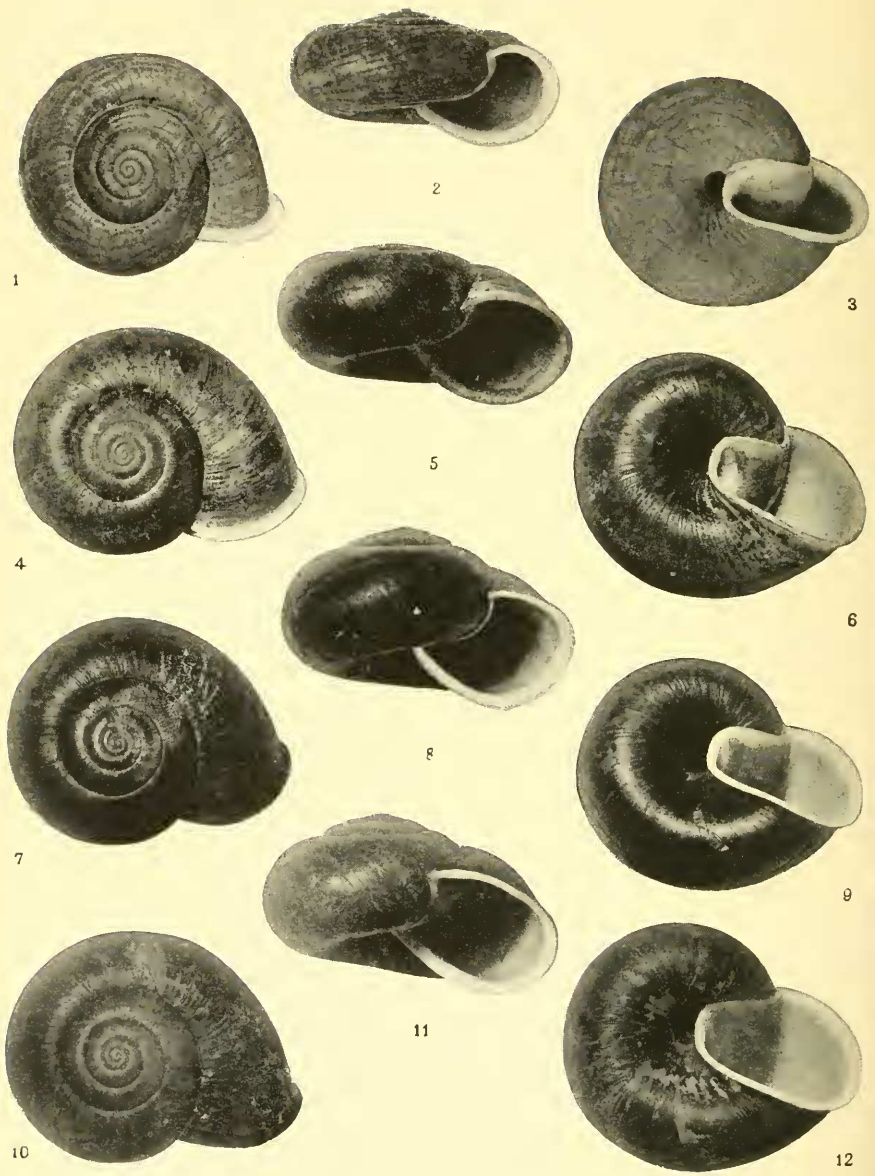
1857. *Helix* (*Chloritis*) *rubra*, Alb. Albers, Malak. Blätt., Bd. iv, p. 93, Taf. ii, figs 1–3. Arrow Island? (Coll. Mousson).  
 1859. *Helix rubra*, Alb. Pfeiffer, Mon. helic. viv., vol. iv, p. 287. Arrow Island (?).  
 1860. *Helix* (*Chloritis*) *rubra*, Alb. Albers, Die Heliceen, 2. Ausgabe von Eduard von Martens, p. 162. Arrow Island.

1865. *Semicornu rubrum*, Alb. *partim*. Wallace, Proc. Zool. Soc., p. 410. Mysol (Wallace).
1868. *Helix rubra*, Alb. *partim*. Pfeiffer, Mon. helic. viv., vol. v, p. 374. Mysol (Wallace).
1876. *Helix rubra*, Alb. *partim*. Pfeiffer, Mon. helic. viv., vol. iii, p. 435. Aru Islands, Mysol.
1879. *Helix rubra*, Alb. *partim*. Dohrn, Syst. Conch. Cab. von Martini & Chemnitz, Die Familie der Heliceen, Th. iv, pp. 569-70. Mysol (Wallace), Aru? (Coll. Mousson).
1880. *Helix (Chloritis) rubra*, Alb. *partim*. Kobelt, Jahrb. Deutsch. Malak. Ges., Jahrgang vii. p. 15. Aru Islands.
1881. *Helix (Chloritis) rubra*, Alb. *partim*. Pfeiffer, Nomenclator Helic. viv., p. 183. Aru Islands, Mysol.
1883. *Helix (Sulcobasis) rubra*, Alb. Tapparone-Canefri, Ann. Mus. Civ. Storia Nat. Genova, vol. xix, p. 166. Aru Islands (Albers), Mysol (Wallace), Molucche (L. M. d'Albertis).
1883. *Helix (Sulcobasis) rubra*, Alb. Tapparone-Canefri, op. cit., vol. xx, p. 149. Molucche (L. M. d'Albertis).
1886. *Sulcobasis rubra*, Alb. Kobelt, Nachrichtenblatt Deutsch. Malak. Ges., Jahrgang xviii, p. 174. Mysol.
1886. *Helix (Sulcobasis) rubra*. Tapparone - Canefri, op. cit., ser. IIa, vol. iv, p. 197.
1890. *Helix (Chloritis [Sulcobasis]) rubra*, Alb. *partim*. Pilsbry, Man. Conch., ser. II, vol. vi, p. 260. Mysol, Aru Islands.
1894. *Chloritis (Sulcobasis) rubra*, Alb. *partim*. Pilsbry, op. cit., vol. ix, p. 120.
1897. *Chloritis (Sulcobasis) rubra*, Alb. Kobelt, Abhandl. Senckenberg. naturf. Ges., Bd. xxiv, pp. 75-6. Batjan (Kükenthal).
1903. *Chloritis (Sulcobasis) rubra*, Alb. *partim*. Gude, Journ. Malac., vol. x, pp. 91, 95, 96. Batchian, Aru Islands, Mysol.
1906. *Chloritis (Sulcobasis) rubra*, Alb. *partim*. Gude, Proc. Malac. Soc., vol. vii, p. 113. Mysol, Aru Islands.

The characters of this sub-species separating it from the others are : Differt ab subspeciebus aliis *Sulc. concisa* spira fere omnino plana, et parte ultima anfractus ultimi sæpe magis dilatata.

In 1857 Albers published an accurate description and good figures of this shell, the habitat of which was supposed to be the Aru Islands. But this statement is, no doubt, erroneous. When several years later Wallace brought home shells of the *concisa* group, both from the true habitat of *rubra*, Alb., and from the Aru Islands, he determined them all as *rubra*, Alb. In the first instance Wallace based his determinations on Albers' description and figures, and also on the statement of habitat, erroneously given by Albers. In fact, his shells from the Aru Islands are not specimens of the true *rubra*, Alb., but belong to a different form, described by Gude as *cumingi*. I have before me one of Wallace's specimens from the Aru Islands, handed over by its collector to the late Dr. H. Dohrn, whose collection now forms part of the Stettin Museum. It is this specimen which Dohrn figured in the Conchylien-Cabinet in 1879. Its examination was





SULCOBASIS CONCISA (FÉR.). FIGS. 1-6.  
SUB-SPECIES CUMINGI (GUDE). FIGS. 7-12.

made possible by the kindness of Stadtrat Hahne of Stettin. Part of the authors, since Wallace, followed Albers' description and figures, and others his erroneously given habitat. All the notes referring to Albers' type, in the Mousson Collection, now in the Zürich Museum, are to be effaced from the fauna of the Aru Islands. But all notes in literature of *rubra*, Alb., alluding to Wallace's specimens from the Aru Islands are to be referred to *cumingi*, Gude. My examination of Albers' type of *rubra*, which I figure on pl. iv, figs. 1-3, is due to the kindness of Professor Dr. O. Stoll of Zürich. One of Wallace's specimens from Mysol, which was accessible to me through the liberality of the British Museum, and kindly sent by Mr. G. C. Robson, is figured on pl. iv, figs. 4-6. These Mysol specimens resemble somewhat in shape the shells of *S. concisa concisa* (Fér.), but are nevertheless to be assigned to *S. concisa rubra* (Alb.). Besides Wallace's accurate locality only two more statements of habitat of the true *rubra* have been mentioned in literature. These are the Moluccas (Tapparone-Canefri, 1883) and the island of Batchian (Kobelt, 1897). In both cases the shells mentioned are true specimens of *rubra*, Alb. The adult specimen from Batchian (an imperfect one was also collected) is figured on pl. iv, figs. 7-9. Besides these there is in the Berlin Museum, in Paetel's collection, a shell from Celebes, which was kindly lent me by Professor Dr. J. Thiele. It differs not at all from true *rubra*, Alb., as may be seen from my figures of it on pl. iv, figs. 10-12. Most probably this shell was taken in the north of Celebes, where there exist other representatives of the Moluccan fauna, but it does not occur in Southern Celebes, which is inhabited by elements of another fauna.

*Sulcobasis concisa rubra* (Alb.) is thus distributed from the island of Mysol (and most probably the adjacent islands) over the Halmahira group of the Moluccas to the north of Celebes. Accurate habitats are: Mysol (Wallace), Moluccas (Albertis) (probably the Halmahira group), Batchian (Kükenthal), Celebes (Coll. Paetel) (north of the island, no doubt). In any case, this sub-species must be eliminated from the faunal lists of the Aru Islands.

## 2. *SULCOBASIS CONCISA CONCISA* (Fér.). Pl. V, Figs. 1-6.

1822. *Helix concisa*, Fér. Férussac, Hist. nat. Moll. terr. et fluv., Atlas, tom. ii, pl. lxxviii, figs. 3, 4.
1824. *Helix concisa*, Fér. Quoy & Gaimard, Zoologie, vol. iii of L. de Freycinet, Voy. Uranie et Physicienne, Zool., vol. iii, p. 470. Rawak Island (Freycinet).
1828. *Helix concisa*, Fér. Wood, Supplement Index Test., p. 23, pl. vii, fig. 53.
1846. *Helix concisa*, Fér. Pfeiffer, Symbolæ hist. Helic., sect. iii, p. 78. Aru Islands (Coll. Cuming).
1848. *Helix concisa*, Fér. Pfeiffer, Mon. helic. viv., vol. i, p. 373. Rawak Island (Freycinet), Aru Islands (Mus. Cuming).
1850. *Helix concisa*, Fér. Férussac & Deshayes, Hist. nat. Moll. terr. et fluv., tom. i, p. 46. Rawak Island (Freycinet).

1850. *Helix* (*Ampelita*) *concosa*, Fér. Albers, Die Heliceen, p. 128. Rawak Island (Freycinet).
1852. *Helix concosa*, Fér. Reeve, Conch. Icon., vol. vii, pl. lxxxvi, species 466. Aru Islands (Mus. Cuming).
1853. *Helix concosa*, Fér. Pfeiffer, op. cit., vol. iii, p. 238.
1855. *Helix* (*Ampelita*) *concosa*, Fér. Pfeiffer, Malak. Blätt., Bd. ii, p. 137.
1855. *Macrocyelis* (*Ampelita*) *concosa*, Fér. H. & A. Adams, Gen. Rec. Moll., vol. ii, 203.
1859. *Helix concosa*, Fér. Pfeiffer, Mon. helic. viv., vol. iv, p. 287.
1860. *Helix* (*Chloritis*) *concosa*, Fér. Albers, Die Heliceen, p. 162. Rawak, Aru.
1865. *Semicornu concosum*, Fér. Wallace, Proc. Zool. Soc., p. 410. Waigiou (Wallace).
1868. *Helix concosa*, Fér. *partim*. Pfeiffer, op. cit., vol. v, p. 374. Waigiou (Wallace), Aru Islands (Mus. Cuming).
1876. *Helix concosa*, Fér. *partim*. Pfeiffer, op. cit., vol. vii, p. 435. Waigiou.
1880. *Helix* (*Chloritis*) *concosa*, Fér. Kobelt, Jahrbuch. Deutsch. Malak. Ges., Jahrgang vii, p. 12. Waigiou.
1881. *Helix* (*Chloritis*) *concosa*, Fér. Pfeiffer, Nomenclator Helic. viv., p. 183. Rawak, Aru Islands, Waigiou.
1883. *Helix* (*Sulcobasis*) *concosa*, Fér. Tapparone-Canefri, Ann. Mus. Civ. Storia Nat. Genova, vol. xix, pp. 165-6. Waigiou (Wallace), Aru Islands (Pfeiffer), Rawak Island (Freycinet).
1886. *Sulcobasis concosa*, Fér. Kobelt, Nachrichtenblatt Deutsch. Malak. Ges., Jahrgang xviii, pp. 174, 179. Aru Islands, Waigiou.
1886. *Helix* (*Sulcobasis*) *concosa*, Fér. Tapparone-Canefri, op. cit., vol. iv, p. 197.
1889. *Helix* (*Chloritis*) *concosa*, Fér. Paetel, Cat. Conchylien-Sammlung, 4. Neubearbeitung, 2. Abtheil., p. 119. Waigiou (Wallace).
1890. *Helix* (*Chloritis* [*Sulcobasis*]) *concosa*, Fér. Pilsbry, Man. Conch., ser. II, vol. vi, p. 262, pl. xlix, fig. 15. Waigiou, Aru Islands, Rawak Island.
1894. *Chloritis* (*Sulcobasis*) *concosa*, Fér. Pilsbry, op. cit., vol. ix, p. 120.
1903. *Chloritis* (*Sulcobasis*) *concosa*, Fér. Gude, Journ. Malac., vol. x, p. 96. Waigiou, Rawak.
1906. *Chloritis* (*Sulcobasis*) *concosa*, Fér. *partim*. Gude, Proc. Malac. Soc., vol. vii, p. 113. Aru Islands.

This sub-species is characterized as follows: Differt ab aliis sub-speciebus *Sulc. concosa* spira subplana, anfractibus supra subplanis, sutura profunde impressa separatis, et sæpius sulcis obliquis distinctis.

In this form special importance has hitherto been attached to the furrows of the shell, a most unimportant and variable character. These furrows are found more or less in all specimens of all the sub-species in question. A shell of *concosa concosa*, the same which Pfeiffer described in 1848, belonging to the collection von dem Busch,

now in the Bremen Museum, and kindly sent me for examination by Professor Dr. H. H. Schauinsland, exhibits much shallower furrows than the type figured by Férussac. The depth of furrows is therefore by no means to be considered as a character of predominant value. It is possible that on certain islands *S. concisa concisa* shows a tendency to produce furrows in a greater degree than usual. This presumption could only be proved by a much larger amount of material, which unhappily is still wanting. Certainly there are specimens of the true *concisa concisa*, the furrows of which are by no means stronger than in the other sub-species. The type locality of *concisa* is the little island of Rawak, near Waigiou (Freycinet); from the island of Waigiou it was brought home by Wallace. Besides these there have been mentioned specimens of *concisa* from Cuming's collection, which were said to come from the Aru Islands and from New Guinea. All quotations in literature refer to these four finds. The shells from New Guinea, which Cuming placed in *concisa concisa*, are in fact very distinct from this sub-species. Gude separated it in 1906 as a new species, which he named *cumingi*. Thus all statements of habitat indicating *S. concisa concisa*, Fér., from New Guinea are based on Cuming's shells, and are to be referred to *S. concisa cumingi* (Gude). The statement which Gude made in 1906 of *S. concisa concisa* (Fér.) coming from New Guinea (after having separated *S. cumingi* from it) is also to be referred to *S. concisa cumingi*, for Gude's statement was only based on the quotations of literature of *concisa* from New Guinea, mentioned above. The specimens from Cuming's collection supposed to come from the Aru Islands and determined as *concisa* certainly belong to that sub-species.<sup>1</sup> One of these shells is figured in Reeve's monograph of *Helix* in 1852. Another shell was given by Cuming to von dem Buseh. It is the specimen mentioned above, which was described by Pfeiffer in 1848, and which is now in the Bremen Museum. Its furrows are not so well developed as in the specimen figured by Reeve. Pl. v, figs. 4-6, in my paper represent this shell. The supposed locality is no doubt erroneous, for no specimen of *S. concisa concisa* (Fér.) exists on these islands, but it is replaced by *S. concisa cumingi* (Gude), as my treatment of *cumingi* will show.

This sub-species is distributed on Waigiou and adjacent islands, and it seems probable that it will also be found on some part of the neighbouring coast of New Guinea. Accurate localities of this sub-species are the islands of Rawak (Freycinet) and Waigiou (Wallace).

### 3. *SULCOBASIS CONCISA CUMINGI* (Gude). Pl. V, Figs. 7-12.

1865. *Semicornu rubrum*, Alb. *partim*. Wallace, Proc. Zool. Soc., p. 410. Aru Islands (Wallace).  
 1868. *Helix rubra*, Alb. *partim*. Pfeiffer, Mon. helie. viv., vol. v, p. 374. Aru Islands (Wallace).

<sup>1</sup> Messrs. G. K. Gude and G. C. Robson were kind enough to procure me photographs of one of Cuming's specimens of true *concisa*; they are reproduced on Pl. V, Figs. 1-3.

1868. *Helix concisa*, Fér. *partim*. Pfeiffer, op. cit., vol. v, p. 374. New Guinea (Mus. Cuming).
1876. *Helix rubra*, Alb. *partim*. Pfeiffer, op. cit., vol. vii, p. 435. Aru Islands.
1876. *Helix concisa*, Fér. *partim*. Pfeiffer, op. cit., vol. vii, p. 435. New Guinea.
1879. *Helix rubra*, Alb. *partim*. Dohrn, Syst. Conch. Cab. von Martini & Chemnitz, Die Familie der Heliceen, Abth. iv, pp. 569-70, Taf. 168, figs. 7-9. Aru Islands (Wallace).
1880. *Helix (Chloritis) rubra*, Alb. *partim*. Kobelt, Jahrb. Deutsch. Malak. Ges., Jahrgang vii, p. 15. Aru Islands.
1881. *Helix (Chloritis) rubra*, Alb. *partim*. Pfeiffer, Nomenclator Helic. viv., p. 183. Aru Islands.
1883. *Helix (Chloritis) rubra*, Alb. Paetel, Cat. Conchylien-Sammlung, p. 135. Aru Islands.
1889. *Helix (Chloritis) rubra*, Alb. Paetel, op. cit., 1. Neubearbeitung, 2. Abtheil., p. 178. Aru Islands.
1890. *Helix (Chloritis [Sulcobasis]) rubra*, Alb. *partim*. Pilsbry, Man. Conch., ser. II, vol. vi, p. 260, pl. xlviii, figs. 1-3. Aru Islands.
1894. *Chloritis (Sulcobasis) rubra*, Alb. *partim*. Pilsbry, op. cit., vol. ix, p. 120.
1903. *Chloritis (Sulcobasis) rubra*, Alb. *partim*. Gude, Journ. Malac., vol. x, p. 95. Aru Islands.
1906. *Chloritis cumingi*, Gude. Gude, Proc. Malac. Soc., vol. vii, p. 48, pl. v, figs. 1, 1a. New Guinea (Mus. Cuming).
1906. *Chloritis (Sulcobasis) rubra*, Alb. *partim*. Gude, op. cit., vol. vii, p. 113. Aru Islands.
1906. *Chloritis (Sulcobasis) concisa*, Fér. *partim*. Gude, op. cit., vol. vii, p. 113. New Guinea.
1906. *Chloritis (Sulcobasis) cumingi*, Gude. Gude, op. cit., vol. vii, p. 113. New Guinea.

*S. concisa cumingi* (Gude) may be distinguished from the other sub-species by the following characters: Differt ab aliis subspeciebus *Sulc. concisa* spira altiore et elevatiore.

The specimens of this sub-species came with Cuming's collection to the British Museum, where they were labelled *Sulcobasis concisa*, Fér., and it was not before 1906 that Gude recognized them as new, and described them as *Sulcobasis cumingi*. All statements in literature concerning *concisa* as from New Guinea refer to Cuming's specimens quoted above, i.e. to *cumingi*, Gude. One of the three specimens of Cuming, a cotype of Gude's species, was kindly sent me for examination from the British Museum by Mr. G. C. Robson, and it is figured on pl. v, figs. 7-9. Comparing this cotype with shells of the *concisa* group coming without doubt from the Aru Islands, the curious fact became evident that there was no subspecific difference between them. It therefore results that either *S. concisa cumingi* (Gude) occurs on the Aru Islands and in the district of New Guinea opposite to them—Cuming gave no certain locality in New Guinea—or that Cuming's statement, the shell now bearing his name coming from